Before The
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
	)	
Digital Television Distributed	)	MB Docket No. 05-312
Transmission System Technologies	)	
	)	

To: The Commission

Comments of the Merrill Weiss Group, LLC

Summary

In response to comments filed by a number of parties in the Second DTV Periodic Review docket, the Federal Communications Commission adopted "in principal" the technology of Distributed Transmission and promised a "fast track" Notice of Proposed Rulemaking to establish the record necessary to support the adoption of permanent rules for the routine licensing of Distributed Transmission Systems (DTS). The above-captioned proceeding is the NPRM adopted by the Commission to carry out its promise. As one of the entities seeking the authorization of Distributed Transmission technology for use by broadcasters, the Merrill Weiss Group LLC commends the Commission for taking this action and offers the following comments in response to the questions raised in the NPRM.

In the NPRM, the Commission addresses eight major topics and asks questions covering many aspects related to the authorization of distributed transmission technologies. These comments address each of those topics and provide answers to as many of the questions as seem appropriate given our knowledge and experience. In certain cases, alternative approaches are discussed so that the Commission can judge which may be the best policy for handling certain aspects of the use of distributed transmission techniques. In those cases, it may be most appropriate for the Commission to look to broadcasters themselves for comments to help determine what will work best for the situations broadcasters face in which distributed transmission can help in resolving coverage and service problems.

In summary, these comments support the need for the Commission to enable the use of distributed transmission techniques as a tool that can be applied by broadcasters to overcome a variety of transmission difficulties and to enhance their services to the viewing public. They generally support the Commission's approach and proposals for permitting DTS. In some instances, they offer alternatives or point our certain shortcomings of the Commission's approach. It is our hope that these comments will help inform the Commission's decision-making and help lead to an early adoption of rules for the routine authorization of DTS operations.

Introduction

The Federal Communications Commission recently released its Clarification Order and Notice of Proposed Rulemaking, MB Docket 05-312, "Digital Television Distributed Transmission System Technologies," adopted November 3, 2005 and released November 4, 2005. In the Order and NPRM, the FCC clarified its interim policy and addressed the matter of permanent Rules for the authorization of use of Distributed Transmission System (DTS) technologies by broadcasters. The Commission briefly explained the technology and its history before it raised a number of questions in each of eight major areas for consideration. These topics are the general benefits to be expected from the use of DTS technology along with possible detrimental effects; the regulatory status to be accorded to distributed transmitters; the location and service area of distributed transmitters; the power, antenna height and emission mask to be used by distributed transmitters; the licensing process to be used for distributed transmitters; the interference protection required when distributed transmitters are in use; the technical standards to be applied to distributed transmitters; and the application of DTS technology to Class A and other low power stations.

To help in the review of our comments they are organized to follow the questions posed in the NPRM. Each major heading from the NPRM is presented followed by the questions posed in the related section of the NPRM. Each question is followed by our answer or comments. The questions are presented in italics, either verbatim or in summary form. Our answers and comments follow in plain type..

General Matters

[W]e seek comment on how DTS operation will serve the public interest and on how such operation will advance the DTV transition. (¶10)

DTS operation will provide broadcasters with an optional tool through use of which they can increase the signal levels they deliver to the public while simultaneously maintaining or decreasing the interference they cause to the signals of other broadcasters. The increase in signal levels to the public will enable more reliable reception in more places, providing greater potential for reception on indoor antennas and offering broadcasters the possibility to be competitive with content distributors using other physical layers such as cable and satellite operators.

DTS operation will advance the DTV transition by making it possible for broadcasters, who otherwise might be stymied in their efforts to build out their maximization facilities or who might be hindered in building facilities on new channels required by the FCC's spectrum repacking process, to complete development of their operations by the various deadlines that can be expected to be associated with those parts of the DTV transition. Given the ability of DTS technology to be used to fill in gaps in the coverage of large transmission facilities, it can help broadcasters reach larger portions of their audiences by delivering signals to parts of the public who, absent DTS solutions, might never receive DTV signals over the air.

How will DTS work with all DTV receivers, including small or inexpensive digital televisions and the digital-to-analog converters many viewers will have for their analog-only televisions? (¶10)

DTS transmitters within a given network have the potential to interfere with one another. The fact of synchronizing the transmitters within that network is for the very purpose of mitigating such interference. The signals that are emitted by all of the DTS transmitters in a DTS network are identical in order to allow the adaptive equalizers that are part of every ATSC-compliant receiver to treat the several signals from the various transmitters

as echoes of one another. Without such transmitter synchronization and receiver signal processing, the multiple signals simply would interfere with each other.

Design of a DTS network focuses on minimizing the amount of interference between transmitters so that receiver adaptive equalizers can treat the interference that remains. Such a design effort starts with the characteristics that can be expected in receivers, generally as expressed in the ATSC Recommended Practice on Receiver Performance Guidelines A/74.[1] Those characteristics are used to predict where interference might occur and to adjust network design parameters to reduce the area where interference is predicted. Then the network can be adjusted so that the interference that remains falls within the range that can be handled by receivers, to the extent possible. Finally, any areas where interference is predicted that is expected to fall outside the range that receivers can treat are placed in geographic regions of low population.

Thus, the design of the network and its ultimate performance depend on the extent to which receivers follow the model presented in the ATSC A/74 document or do better in their performance. Recent information from manufacturers of receiver front ends indicates that they are testing their receiver designs against the A/74 document. Moreover, the contracts recently let by the Association for Maximum Service Television (MSTV) and the National Association of Broadcasters (NAB) for the digital-to-analog converter prototypes they are purchasing to serve as models for the industry include requirements that the receivers comply with the ATSC A/74 document.

Since the number of ATSC over-the-air receivers currently is relatively small but is expected to grow rapidly with the implementation of the Commission's tuner mandate, and since the receiver component industry is generally moving to the voluntary ATSC Receiver Performance Guidelines, it can be expected that DTS will work well with the bulk of receivers that will be in use by consumers, including small or inexpensive digital televisions and the digital-to-analog converters that many viewers will have to their analog-only televisions. When older receivers with lower performance are in use, it is

[1] Available from http://www.atsc.org/standards/practices/a_74_rfs.pdf.

generally expected that any problems they present can be overcome through the use of directional receiving antennas.

Will consumers, cable headends, and satellite local receive facilities need additional equipment to ensure reliable and high quality reception as compared with the equipment associated with reception of a single transmitter station's signal? (¶10)

As a general matter, consumers, cable headends, and satellite local receive facilities will not need additional equipment to ensure reliable and high quality reception as compared with the equipment associated with reception of a single-transmitter-station's signal. The signals transmitted using DTS techniques will be completely compatible with the equipment already in use for reception. Depending upon precisely where a given receiver is located, there will be some instances in which a directional receiving antenna may be required in order to overcome internal network interference that happens to fall in the area in which the receiver is situated.

Will DTS operation impact the service provided by traditional single-transmitter stations? (¶10)

With properly designed networks, DTS operation will not impact the service provided by traditional single-transmitter stations. It will be a requirement for the authorization of such transmitters that the networks in which they are included provide the same level of interference protection to neighboring stations as would be accorded by single-transmitter implementations. Thus, the impact upon neighbors will be essentially the same under the two modes of operation by design of the regulatory regime under which DTS systems will be authorized. The worst case situation that will be encountered is likely to be the operation of a DTS network on an adjacent channel to a single-transmitter operation. Antenna design techniques have recently been developed that permit control of interference even in these cases, so that the Commission's interference requirements, as spelled out in OET Bulletin Number 69, can continue to be met.

What, if any, is the burden on local communities in permitting DTS operation? (¶10)

No particular burden is expected on local communities in permitting DTS operation. There may be a small increase in the number of towers that will be sought to be constructed in some areas. Please see the response to the next question with regard to this impact.

Will DTS operation require the erection of multiple telecommunications towers rather than collocation on existing towers? (¶10)

In general, it should be possible for DTS operations to be accommodated on existing towers that are spread throughout the areas that the DTS operations will be set up to serve. The types of towers that can be used include those of other television stations, FM stations, cellular telephone operations, two-way radio services, and the like. This is possible because the typical DTS transmitter will require its center of radiation to be somewhere between 30 and 100 meters above ground level. Space of this sort usually can be found on existing towers for lease. Of course, there will be some instances in which towers will have to be constructed to provide service to specific regions where no appropriately sited tower space can be obtained on existing towers.

In certain instances, particularly when there is an adjacent channel, high power, single-transmitter operation in the same market, one of the DTS transmitters in the network may have to be mounted at a higher elevation and may have to use somewhat higher power than typical for DTS designs in order to obtain adequate protection from that adjacent channel neighbor. In such instances, the higher power DTS transmitter normally will be collocated with the adjacent channel neighbor in order to reduce the interference between them, and the use of existing towers can be expected in such cases. When DTS techniques are used to fill in or extend the service of an existing, high power DTV operation, of course, one of the antennas will be mounted on a tall tower, but that tower presumably will already exist to provide the high power DTV service that is being enhanced.

How will the timing of the build-out of digital service be affected by DTS? (¶10)

Use of DTS methods have the potential to enable an earlier build-out of digital service for those stations that are impaired from reaching their complete potential audiences for one reason or another. For example, stations that have major obstructions in their signal paths in some regions can fill in their service areas by using DTS techniques for "gap fillers." In other cases, stations may be stymied in their efforts to build as large maximized operations for their single transmitters as they would like because of limitations in tower capacity; DTS techniques can allow them to extend their service areas for maximization purposes, thereby achieving a complete build-out sooner than would otherwise be possible.

How will DTS affect the costs experienced by licensees? (¶10)

The costs that will be experienced by licensees in implementing DTS technology will depend upon their specific circumstances. In cases in which stations implement DTS methods in place of a single, high power transmitter that has not yet been constructed, they can expect to save over the cost of the single-transmitter facility. This occurs because the capital cost may be about the same as for a large, single-transmitter operation, but the operating cost, especially for primary electric power, can be considerably less. In cases in which stations use DTS methods to fill in gaps in their service areas or to extend their service areas, the costs can be expected to be about the same as they would be for booster or translator operations of the same power levels at the same sites, with the possible exception that the cost to deliver the signals to those locations may be higher if separate channels are used for signal delivery. This will depend on the degree of adjustment required in the timing of the signals to be transmitted, which, in turn, will depend on the terrain and the geometric relationship between the smaller DTS transmitter and the larger one, the service of which is being enhanced.

How will DTS technology impact small business broadcasters? (¶10)

Depending on the particular circumstances, DTS technology has the potential to reduce costs for small business broadcasters and to allow them to expand their service areas over

time through smaller, incremental expenditures rather than single large ones. If such broadcasters have built smaller facilities than the full maximization that the FCC Rules would allow, they can add to their service areas by adding DTS transmitters over time, gradually increasing their coverage areas at relatively much lower cost than would be required to accomplish the same extension from a single, large transmitter facility because of the significant increase in power needed to push signals out great distances from a single transmitter.

Regulatory Status

We seek comment on the anticipated benefits of DTS and our tentative conclusion to provide primary status within a licensee's service area… (¶13)

The major benefits of DTS are the ability to provide increased signal levels spread more uniformly throughout a service area while maintaining or reducing the level of interference to other stations. This result comes from the fact that transmitters can be closer to receivers, reducing the fade margins required and allowing lower overall radiated power levels while achieving the same service area coverage.

To permit the use of DTS technology by licensees who wish to employ a number of lower power transmitters instead of a single, high power transmitter, according primary status to those several transmitters is a requirement. Without primary treatment, stations will be discouraged from using DTS. Without primary treatment, stations will lose protection in any portions of their service areas served by transmitters other than their single, main transmitters that are given primary status. Without primary treatment, use of DTS would be a way to assure loss of protection to whatever areas were served only by DTS transmitters. Without primary treatment, use of DTS would become a way for stations to assure their second class status within their markets. Lack of primary treatment would be a way to assure that DTS is rarely used.

We seek comment on [the proposed] rules and procedures. (¶13)

The Commission proposes to license DTV transmitters under Part 73 of the rules. Given the need for primary status for DTS transmitters, as discussed under the preceding question, this is most appropriate. The Commission proposes to use application filing and processing procedures similar to the current procedures. Except as discussed in the next section on location and service area with respect to the determination of coverage and the allowance of improved service in cities near the edge of a station's authorized service area, this is an appropriate approach. The Commission expects to modify FCC Forms 301 and 302 to accommodate the DTS systems. This is appropriate except that the Commission also should include Form 340 to cover non-commercial educational DTV stations that choose to use DTS techniques.

Location and Service Area

We seek comment on [the] tentative conclusions [rejecting proposals for a DMA limitation and for an extension of existing service areas as a method for determining where DTS transmitters can be located and the areas they can serve.] (¶19)

In past comments, we have offered a number of methods that the Commission might use to limit the locations where DTS transmitters can be situated and the areas that they can serve. The DMA approach and the extension of existing service areas approach addressed in the NPRM were two of several methods that were offered previously. For example, a method that controlled the interference contours of a DTS network so that they were limited to falling on or within the interference contour of a hypothetical single transmitter at the reference location also was explored in detail in prior comments.

We have no particular point of view with respect to which of the several methods we have explored should be selected by the Commission. Rather, we have identified as many possible solutions as we could so that the Commission could consider the widest range of options. We believe that it should be the broadcasters themselves who make the case for the most appropriate option in this area. Nevertheless, we are concerned that the FCC adopts rules that recognize the benefits that DTS can make available and not overly

limit the use of DTS transmitters so that some of those important benefits are lost. In particular, we believe that the Commission should adopt rules that permit the highest possible signal levels to be achieved near the edges of whatever service area is selected and recognize that achieving such improved service will necessarily result in contours that extend beyond the limits of such a service area.

Perhaps an example will help in making clear the reason for these comments. Consider a major city in which all the broadcasters have their reference points at a single antenna farm. Consider a smaller city that is part of the service area of the stations in that large city but that is near the contours of the stations in that market. In the region near the contours of those stations, the signal will be very weak – approaching the noise-limited threshold for those stations. Applying something like the Commission's circular service area proposal or any other contour-limited scheme would mean that the signals from distributed transmitters intended to serve the smaller city necessarily would have to be very weak so that they would not create contours extending beyond whatever reference contour were chosen. This can be particularly troublesome when the smaller city is located in a valley where it is effectively cut off from the signals of the stations in the market. Similar situations also exist for rural regions near the edge of the authorized service area.

We believe that the public will be far better served if DTS techniques can be used to provide increased signal levels to cities such as described that are near the contours of the stations in the larger markets of which they are part or are on the edges of the service areas of other stations in their markets. Otherwise, such cities will be forever relegated to receiving inferior signal levels and never have the opportunity for indoor reception of desired broadcast signals. In such cases, to enable delivering stronger signals, it will be necessary to permit the contours of the DTS transmitters to extend beyond the limits of whatever service area definition is selected by the Commission.

Avoiding stations extending beyond their service areas in such situations can be controlled by requiring applications to show that the service, as measured using the population service predictions of a terrain-based propagation model such as that

contained in OET Bulletin No. 69, is largely inside the assigned service area, with only a smaller proportion of the population reached being outside the assigned service area. This approach recognizes, for instance, that a DTS transmitter located on the edge of a valley, with its signal largely constrained to the valley by terrain, nevertheless is likely to create a much larger contour than the area it serves that necessarily will extend beyond the boundary of the assigned service area.

Our comments come from experience designing a number of DTS networks in a variety of terrain and market situations. As a practical matter, when providing improved signal levels to viewers inside a service area, there is no way to avoid the laws of physics and make the signal stop at some arbitrary border. Thus, if methods are to be implemented to allow real world increases in the signal levels delivered over the bulk of service areas, then provisions need to be made for the extensions of contours outside those service areas. These contour extensions can be controlled through the establishment of a requirement for most of the population served by a DTS transmitter to be within whatever service area is defined by the Commission. For example, a workable proportion would be to require that 75 percent of the population reached above the noise limited threshold from each DTS transmitter must be within the defined service area, while up to 25 percent could be outside the defined service area, however it is defined.

We seek comment on whether a different reference point should be used [than one based on a station's certification in the post-transition DTV channel election process], for example, based on a station's initial DTV allotment or the allotment established in its individual DTV channel change rulemaking. (¶21)

The Commission's proposal to use a station's reference point from its certification in the post-transition DTV channel election process is the correct choice if the Table of Distances method is the one finally selected as the basic method for determining service area. With some other approaches that have been proffered, the reference point has no relevance. Since, in using the Table of Distances method, the Commission proposes to extend the service area to include territory a station already covers, for a station that has moved its reference point, its defined service area would be further enlarged if the FCC

used some other reference point than the one on which its final selection is based. Moreover, a move to some reference point that a station did not expect when it made its plans and built whatever facilities it has done so far likely would upset many years of planning and potentially millions of dollars of construction already undertaken.

We …request comment on what process could be used to change reference points without circumventing the limits created by the proposed distance table. (¶21)

Should the Commission choose to implement the Table of Distances approach, then stations should be permitted to change their reference points, just as they historically have been permitted to change their transmitter locations so long as certain criteria were met. For practically the history of the television rules, stations were given the freedom to move their transmitter sites so long as they delivered City Grade signals over their principal communities and there were not major obstructions in the paths over those principal communities. Presumably such flexibility will continue to be accorded to stations once the Commission's freeze on applications is lifted, and similar flexibility should be accorded stations that choose to use DTS techniques.

Perhaps one way to allow the changing of reference points without circumventing the limits created by the proposed Table of Distances would be to permit changes in reference points that resulted in the service area circle encompassing a station's replication service area, as that area has been previously defined. Another way would be to require that the reference point be chosen so that a DTV City Grade signal could be delivered over the principal community from a hypothetical maximized facility located at the proposed reference point. In such a case, the issue of obstructions in the path from the reference point over the principal community would be immaterial so long as one or more transmitters in the DTS network delivered the required signal levels to the principal community unobstructed by major topographical features.

We seek comment on [the] proposals and conclusions [to use a table of distances to define the area] within which all DTS coverage contours must be contained. (¶21)

Compared to some of the other potential methods that have been put forward, the Table of Distances approach has the possible benefit of being a little bit simpler to administer. The concern that we have for this method revolves around the ability to provide signal strength improvements to cities that are near the edge of the defined service area, however that service area is defined. Please see the comments above to the first question in this section in that regard.

One flaw that exists in the Table of Distances method is that it does not recognize the provision that has been in the Commission's rules since the beginning of the DTV allocation process that permits stations to increase the size of their facilities to match those of the largest station in their market. To take one example, in the Los Angeles market, one station (KCBS-DT) was allotted facilities of 866 kW at an average height above average terrain (HAAT) of 1107 meters on Channel 60. After correcting for the dipole factor, this results in a distance to the 42.7 dBu F(50.90) contour of 136.2 km. There are similar situations in other markets. In these cases, the service areas available to stations using DTS should be no less than those available to other stations in the market that choose to use single transmitters. In addition, for the reasons stated above, provisions to permit high quality service to cities and rural areas near the edge of the authorized service area should be included.

We seek comment on [the proposal] to use the table of distances in areas in which irregular terrain is an issue. (¶23)

If the Table of Distances approach is the one selected by the Commission, then the proposal to apply the method in areas in which irregular terrain is an issue is a good one. In circumstances in which terrain cuts off service in some directions, it will be possible to provide service through the use of additional transmitters. At the same time, in directions in which a station's HAAT is higher than the value assumed for maximized facilities implicit in the Table, the station's service area will be able to extend to what it already

has authorized. Both of these outcomes seem eminently fair and will benefit service to the public.

We seek comment on the usefulness of [the] Table and the validity of the underlying assumptions. (¶24)

The principal benefit of the Table of Distances approach appears to be its simplicity of administration. It does not recognize the community of interests implicit in market-based methods such as that using the DMA. It does seem to recognize the value in permitting stations to retain the service areas to which they are already authorized, even when those existing service areas fall outside the circles that the Table describes. It has the major flaw of not recognizing those situations in which stations in a market are authorized for much larger service areas and other stations in that market are entitled to match the facilities of those larger stations. It also needs to take account of the need to provide improved service to communities near the boundary of the service area assigned to any particular station, as discussed above.

We … seek comment on the effect of such assumptions on the scope and range of the service area and populations to be served by stations that use DTS. (¶24)

The assumptions underlying the Table of Distances seem to relegate all stations that would use DTS to the same, limited service areas, even those whose single-transmitter facilities would cover much larger service areas. This effect was described above in answer to the last question posed in paragraph 21. It also would limit the service areas of stations that would otherwise be a bit larger due to the effect of the dipole factor, but this effect is relatively small compared to the one described previously. It is most important, no matter which method is selected for determining the service area, that provisions are made for improving service near the edges of that service area, by allowing stronger signals to be delivered to the populations who live in those regions. This can only be achieved by limiting the predicted service on a proportional basis to the populations within the defined service area and reducing dependence on contours for making decisions about the area served outside the assigned service area.

Would this inadvertently result in significantly expanded areas of service beyond what our current maximization rules contemplate? Or would the result be more effective service over the typical potential area? (¶24)

The use of the Table of Distances would not result in significantly expanded areas of service beyond what the current maximization rules contemplate. Indeed, as described several times above, the result, as the method is currently fashioned, would lead to limiting the service near the edges of any station's service area to the same low levels that can be delivered today. Such a limitation will reduce the effectiveness that could otherwise be obtained over the typical potential area. Consequently, if the Table of Distances is used to define the service area, then provisions must be made to allow high signal level service within the service area through acceptance of contours that extend beyond the defined service area. As stated several times above, this result can be achieved through use of service prediction software based on the OET Bulletin No. 69 techniques to determine where the populations are that are predicted to receive service.

We seek comment on alternative ways to determine the service areas appropriate for DTS operation, as well as alternate methods to determine or limit incidental expansion of service areas. (¶24)

We have offered a number of methods for determining service areas in our several sets of comments on the matter of DTS. These include a DMA approach, a contour extension approach, and an interference contour limitation approach with several different values for protection between stations. To these can be added the Commission's proposal for a Table of Distances. As we have stated previously, we have no preference for which of these, or some other scheme, that is chosen. Our principal concern is that whatever definition for the service area is chosen allows for the efficient delivery of strong signals to viewers.

We seek comment on how best to account for [the] differences [in coverage between conventional and DTS operations that may be unavoidable] while maintaining that DTS systems comply with the requirement to serve essentially the same population as conventional systems. (¶25)

In general, the objective in designing a DTS system is to achieve the highest possible average signal level over the largest possible population. As a result, DTS systems often can provide better coverage of the same population than conventional systems would provide. If the objective is to assure that a DTS system achieves at least service comparable to what would be obtained from a single-transmitter facility, the two could be compared using terrain-based propagation modeling software and counts of population receiving signals above a particular field strength threshold.

We seek comment on [the] approach [to determining that DTS facilities would not result in loss of service to the population currently served within the licensee's service contour] but also ask whether a more objective standard can be used to prevent cherry-picking while allowing for differences in technology. (¶25)

The Commission clearly understands that practically any transmitter, no matter what the size of its service area, can have areas within its service area to which it delivers adequate signal levels for reliable service and other areas in which the signal level may not always be adequate for reliable service. Over a given terrain, the smaller the service area at a particular signal level, the more reliable the service is to be because of the lower amount of fading that occurs over shorter distances. The contour overlap method that the FCC has proposed for determining service within the service area is a reasonable way of assuring that the population within a station's service contour receives service. Another way to evaluate the result sought would be through population counting using a terrain-based propagation modeling tool. Of course, it must be pointed out that no such requirement to deliver signals to any particular population is applied to single-transmitter operations other than the requirement to put a particular field strength contour over the principal community.

Power, Antenna Height, and Emission Mask

No questions asked.

We note that the Commission did not seek comment or ask any questions with respect to this portion of the NPRM. Nevertheless, we offer the comment that the Commission's decisions in this area all seem correct to us, and we support them.

Licensing Issues

We seek comment on [the proposed] approach [of licensing DTS transmitters as part of a linked group that will be covered by one construction permit and license, with normal CP expiration dates] and on how to provide licensees and permittees with flexibility to serve viewers as quickly as possible but without the risk of commencing service in one area while delaying service to another area containing fewer or less affluent viewers (i.e., cherry-picking). (¶28)

The proposed approach of licensing DTS transmitters as part of a linked group to be covered by one construction permit and one license, with normal CP expiration dates, is one of several possibilities discussed in prior comments and is a sensible procedure. An important aspect of whatever procedure is chosen will be to provide the mechanisms by which the several DTS transmitters in a licensee's system can be determined by the Commission's (and the industry's) interference analysis software to be part of the same network. This will be important for studies of interference both from and to the DTS operation.

Regarding the process by which DTS service can be turned up as a network is built, while still addressing the Commission's concerns about "cherry-picking," one approach would be to permit DTS transmitters to be operated under automatic program test authority as soon as they are able to be put on the air, with notice required to the FCC as each transmitter is turned on. The first such transmitter being put on the air could trigger a requirement for periodic reports to the Commission on progress in the construction of the other transmitters in the DTS network. The network would not be licensed until at least

the transmitters necessary to provide the minimum required service had been put into operation.

In establishing this procedure, it must be recognized that, with a number of facilities to construct in a DTS network, it only will be natural that some will proceed more rapidly than others, and some may run into unexpected difficulties that others will not experience. In such cases, at least the same considerations that apply to construction of single-transmitter facilities should apply. In some cases, it may be necessary for permittees to seek to modify their permits to work through such difficulties, and reasonable extensions should be granted in such cases.

This process, of course, would only apply in situations in which a station was implementing a DTS system involving only small facilities in which none of them covered the complete required service area. In cases in which a large, single-transmitter operation was being converted to DTS operation by the addition of one or several gap fillers or was being maximized by the addition of transmitters around the periphery of its existing, previously-licensed service area, no such notice would be required because the basic service requirements would already have been met by the initial large facility.

We request specific comment on whether service in the principal community can be relied upon if it is provided from multiple transmitters (where the interaction between the signals from the different transmitters may make reception difficult or impossible in some part of the overlapping coverage areas). (¶28)

It is understandable that the Commission would be concerned with the quality of service provided to the principal community. It is true that, despite the synchronization of transmitters in a network, there can be places where the interaction between the signals from different transmitters may make reception difficult or impossible. Applying an arbitrary requirement that the entire principal community be covered by a single transmitter, however, more likely would be counter-productive rather than helpful.

As a general rule, it is in a broadcaster's best interest to cover its principal community with as reliable a signal as possible, just as it is throughout its service area. There are

many cases in which service to some part of a principal community can be blocked from a single transmitter. Take Los Angeles, for example; even from the Mt Wilson antenna farm, where nearly all Los Angeles area stations are located, there are parts of the city that are obstructed by some of the mountains that exist within the city limits. A rule that required that the principal community be served by a single transmitter would require high power transmitters at Mt Wilson as the only solution for covering the largest part of the city and would preclude the use of smaller transmitters as gap fillers for places within the city like Bel Air, Beverly Hills, and Hollywood that are obstructed from Mt Wilson. Similarly, in a place like Rancho Palos Verdes, CA, where there is a mountain dividing the community in two, there could be no distributed transmitter installed to provide service to the almost half of the community that cannot receive signals from any existing broadcast site in the region.

It should be recognized that one of the most effective uses of distributed transmission, one that eliminates virtually all interference between transmitters in a DTS network, although the most expensive and least likely to see early implementation, is the installation of transmitters very close to one another, for instance, every mile or so. With a rule that required coverage of the principal community with a single transmitter the possibility of making the most effective use of DTS technology would be precluded. Such a result would be counter to the objectives of spectrum efficiency that led the Commission's own Spectrum Policy Task Force to endorse the technology.

We … seek comment on whether additional or different restrictions would be appropriate for DTS transmitters. (¶28)

With the requirements already included in the Commission's proposals, it seems to have covered the restrictions and conditions necessary to reasonably assure that the technology is applied responsibly. One procedural matter it seems not to have addressed is the method by which a station will convert a single transmitter operation into part of a DTS network when the station wishes to add smaller transmitters as gap fillers or to extend service as part of its maximization. Perhaps this is a mundane matter that was assumed in

the NPRM would be handled as part of the effort to revise the application forms and other aspects of application processing.

Interference Protection

[W]e seek comment on whether to calculate interference based on each DTS transmitter individually … or based more conservatively on the combined signals of all the DTS transmitters. (¶30)

In comments in earlier proceedings, we have pointed out the two possible methods of dealing with the aggregation of interference from multiple transmitters about which the FCC now seeks comments. Despite the assertion in the NPRM to the contrary, we have not previously taken a position favoring one of the two methods but rather pointed out the effects of choosing each one over the other. We continue to have no preference. As we stated in comments in the 2nd DTV Periodic Review proceeding, "In the end, whether to aggregate the interfering signals from distributed transmitters in a network must depend upon how conservative the Commission wishes to be in affording protection to neighboring stations versus how much it may wish to enable greater service by distributed transmission networks. If it wishes to be conservative regarding interference to neighbors, it will choose to aggregate the received signal powers, as described elsewhere herein. If it wishes to enable the maximum service from distributed transmission networks, it will recognize that the likelihood is very small of signals from two transmitters in a network arriving within 93 ns of one another at a receiver in an adjoining station's service area. In this case, it will allow the signals from the distributed transmitters in a network to mask one another, thereby somewhat simplifying the calculation of interference."

In our work developing DTS network designs for clients, we have conducted the interference calculations both ways in order to see how much difference there might be and of what sort. After evaluating hundreds of thousands of study cells for interference from multiple transmitters, we found only a few in which the more conservative approach showed interference where the less conservative approach did not. This result derives from the fact that the conditions necessary to cause interference to be caused in one case

but not the other occur in a very narrow range of field strength relationships between the several signals that must combine to cause the effect. In none of our studies have we seen the choice between the two methods make a difference that pushed the population receiving interference over the threshold of acceptability with respect to any desired station. Nevertheless, it can be expected that such differences will occur; they just seem to be very rare. In the end, the Commission must decide which form of calculation it wishes used and whether the increase in software complexity to conduct the more conservative calculation is worth the time and cost to develop and test the necessary routines for the return in expected precision of the calculation.

We seek comment concerning ongoing experimental operations that might help us develop a more appropriate mechanism for considering the interference caused or received by a DTS operation. (¶31)

There are two experimental operations of DTS systems of which we are aware. One has been on the air at WPSU-DT (formerly WPSX-DT) in State College, PA, since July, 2003. It was designed to implement and test the technology of DTS from the standpoint of whether the synchronization methods worked and whether they helped mitigate internal network interference. It is expected that some amount of test data will be available from that operation to the FCC during the pendency of this proceeding. It was not set up to measure interference from or to a DTS network, however, and such information likely will not be forthcoming from that test.

The other test is being conducted by Tribune Broadcasting in Indianapolis. It was set up to test the effects of multiple transmitters on various generations of receivers and to show whether multiple transmitter operations would work as well in an environment with little terrain obstruction between DTS transmitter service areas. There will be no testing of interference caused or received by a DTS operation, so no information of that sort should be expected by the Commission. Given the well-known difficulty of testing interference in the field and given the limited budgets for the testing being done, this is not a surprising situation.

Technical Standards

We encourage stations that are using DTS technology to provide us with data on the performance of the technology and the extent to which internal interference is minimized. (¶33)

As discussed with respect to the preceding question, testing is being done by the Pennsylvania State University station, WPSU-DT, that is intended to show the performance of the technology of multiple, synchronized transmitters and the benefits with respect to mitigation of internal network interference. Data from that testing is anticipated to be available to the Commission prior to its reaching a decision on rules for DTS operation, but it likely will become available after the conclusion of the comment periods in the current NPRM proceeding.

What is the likely effect of [patents on the technology for synchronizing transmitters] on potential users of DTS technology? (¶34)

For the record, the Merrill Weiss Group LLC has a patent interest in the technology that is embodied in the ATSC Synchronization Standard for Distributed Transmission A/110A. A patent has not yet been issued but is expected soon. Prior to the technology being adopted for use in the ATSC standard, a letter undertaking to offer the technology on Reasonable And Non-Discriminatory (RAND) terms was provided to the ATSC. This is no different than any of the other technology included in ATSC standards, almost all of which is encumbered with patent interests of one sort or another. Since there is no effect of all the other patents on users of the ATSC technology in general, there should be no particular impact on potential users of DTS technology either.

Would such patent interests adversely affect licensees' use of the proposed DTS service? (¶34)

The reason for developing the technology that enables synchronization of transmitters to support DTS operations was that it was understood that synchronization of transmitters was required to meet our objective of enabling single-frequency networks (SFNs) in

ATSC system and there was a general belief in the industry that such synchronization "couldn't be done." Since the objective of developing the technology in the first place was to enable the establishment of DTS service, it is hard to see how it could adversely affect licensee's use of the proposed service. Without the technology, there would be no such service currently under consideration.

Does the Commission need to take steps to ensure that licenses to MWG's technology and any other patented technology that might be developed to implement DTS are offered on a reasonable and nondiscriminatory basis? (¶34)

The steps needed to ensure that licenses to MWG's technology are offered on a RAND basis have already been taken by the ATSC. Any other such technology that is developed and brought to the ATSC (or any other standards body) will have to be offered on a similar basis if it is going to be included in an open standard. (There is, in fact, such technology currently in the ATSC standards development process.) While it would be in MWG's interest to suggest that the Commission should take steps to ensure that licenses to other such technology are offered on a RAND basis, we believe that would be the wrong approach as a matter of policy for the Commission.

Since the Commission has indicated that it will not adopt a technical standard for the synchronization of transmitters – an approach that we have supported throughout this process – and the marketplace is open to competing methods for carrying out the necessary transmitter synchronization, there is no need for the Commission to step into the matter of assuring technology availability on a RAND basis. To do so, the Commission would first have to carefully define what the technology is over which it was going to exert control; it would then have to define the performance levels that qualified for use in the service; and then it would have to establish procedures for ascertaining which systems fell under the requirements. All of this would slow the availability of new technology and try to assure through government action what the marketplace is already sorting out on its own through the operation of the open standardization process. Doing so would be both a disservice to the industry and a waste of precious FCC resources.

Are there other means of using DTS that would not necessitate obtaining licenses for patented technology or equipment? (¶34)

There probably are other means of using DTS that would not necessitate obtaining licenses for patented technology or equipment. But since knowing that such technology exists and is not covered by any valid patents can take a great deal of research and often is only decided after a decision by the courts, it is a question that cannot be definitively answered. The most that can be said is that there is technology available that will be offered in the marketplace on Reasonable And Non-Discriminatory terms, and there is likely to be more such technology available in the relatively near future.

Class A, Low Power, Translator, and Booster Stations

[W]e seek comment on whether to permit a Class A or LPTV licensee or permittee to use DTS technology to operate single frequency networks within the protected contour of its authorized station. (¶37)

DTS technology offers solutions to many difficult propagation and terrain challenges. Permitting its use in the widest range of applications makes good sense from a spectrum policy perspective. Thus, its use by Class A and LPTV operations to operate single frequency networks with their authorized service areas also makes sense.

[W]e seek comment on appropriate rules to govern the authorization and operation of such service [by Class A and LPTV stations]. (¶38)

We do not have the experience with Class A and LPTV operations to comment knowledgeably on this question.

How should we determine permissible transmitter locations in such DTS systems and protected service areas? (¶38)

We do not have the experience with Class A and LPTV operations to comment knowledgeably on this question.

Should we apply the power and emission limits that now govern digital LPTV and Class A stations? (¶38)

We do not have the experience with Class A and LPTV operations to comment knowledgeably on this question.

We … seek comment on the impact of our DTS proposals on the need for low power digital booster stations. (¶39)

We believe that all possible tools should be made available to broadcasters to solve their signal delivery challenges. Low power digital booster stations are such a tool and should be permitted.

Will DTS transmitters … reduce the need for [digital booster] stations, or is there a purpose for both types of stations (e.g., due to differences in the costs and technical complexity of digital boosters and DTS stations)? (¶39)

DTS transmitters likely will somewhat reduce the need for digital booster stations because more boosters likely would be needed if there were no possibility for DTS solutions. Nevertheless, there is a purpose for both types of stations so that broadcasters can have the widest range of tools for delivering their signals.

To what extent does our allowance in the digital LPTV proceeding for on-channel digital TV translators reduce the need for digital boosters? (¶39)

We understand on-channel TV translators to be substantially the same as digital boosters. If that is truly the case, the largest difference between the two types of stations may be regulatory, in terms of where and when they can be used and the procedures for making application for them.

Conclusion

In these comments, we have endeavored to respond meaningfully to nearly all of the Commission's questions on the subject of Distributed Transmission Systems. We believe the technology of distributed transmission can be an extremely valuable tool for many

broadcasters in providing expanded DTV service to the public. With relatively few changes to its Rules, the Commission can and should develop a regime that enables routine licensing of distributed transmission systems. Because distributed transmission systems will help accelerate the DTV transition in a spectrally efficient manner, the Merrill Weiss Group LLC submits that the rule changes that eventually may be adopted by the FCC are decidedly in the public interest.

Respectfully submitted,

Merrill Weiss Group LLC

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